



MONTHLY AIR QUALITY REPORT FOR
JANUARY 2009

AOI COLOR SCALE

GOOD	MODERATE	UNHEALTHY FOR SENSITIVE GROUPS	UNHEALTHY
0-50	51-100	101-150	151-200

Calendar of maximum AQI values & their corresponding color for January 2009*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

1 (day of month)	O3	CO
	PM10	PM2.5

	SUN		MON		TUES		WED		THU		FRI		SAT							
								1	30 67	51 167	2	28 44	31 90	3	32 32	26 76				
4	27 17	18 62	5	24 15	08 23	6	27 31	24 48	7	22 39	28 69	8	22 48	31 72	9	34 43	33 62	10	35 27	19 45
11	36 40	25 78	12	33 62	27 66	13	33 63	28 65	14	28 62	18 58	15	34 57	22 55	16	36 64	25 62	17	35 44	26 68
18	36 40	25 68	19	38 58	14 48	20	37 59	20 48	21	33 65	22 48	22	25 30	11 26	23	25 38	16 33	24	24 19	17 39
25	28 20	20 40	26	36 38	09 22	27	33 27	07 14	28	31 44	13 37	29	36 54	22 51	30	36 35	16 51	31	37 52	19 38

Calendar of High Pollution Advisories and Health Watches issued during January 2009

SUN			MON			TUE			WED			THU			FRI			SAT		
												1			2			3		
4		5			6			7			8		E	9			10			
11		12			13			14			15		E	16			17			
18		19			20			21			22			23			24			
25		26			27			28			29			30			31			

LEGEND

HIGH POLLUTION ADVISORIES

- A** = PM-10 High Pollution Advisory
- B** = PM-2.5 High Pollution Advisory
- C** = Ozone High Pollution Advisory

HEALTH WATCHES

- D** = PM-10 Health Watch
- E** = PM-2.5 Health Watch
- F** = Ozone Health Watch

Calendar of Meteorological Conditions observed in Metro Phoenix during January 2009

SUN			MON			TUE			WED			THU			FRI			SAT		
												1			2			3		B
4	A B C	5			C			6			7			8		E F	9			10
11		12			E			13			14		E	15		E	16			17
18		19			E			20			21		B	22		B	23		A B	24
25		26			27			28			29			30			31			E

LEGEND

ELECTROMETEORS

- A** = Thunderstorm

HYDROMETEORS

- B** = Rain/Drizzle/Hail/Snow
- C** = Fog

LITHOMETEORS

- D** = Blowing Dust
- E** = Haze (vsby <10SM)
- F** = Smoke

Exceedance days during JAN 2009-

<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
1	01/01	167	PM-2.5	West Phoenix
		158	PM-2.5	South Phoenix
		154	PM-2.5	Durango
		135	PM-2.5	Phoenix Supersite

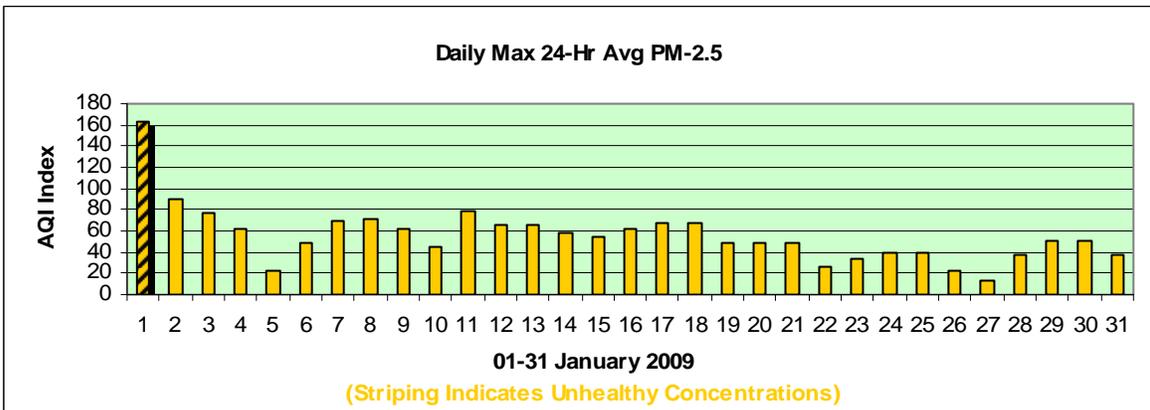
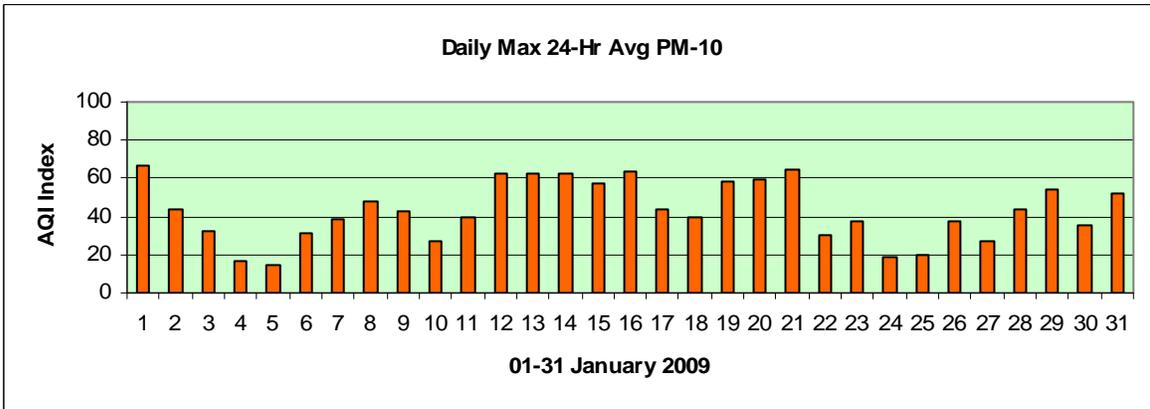
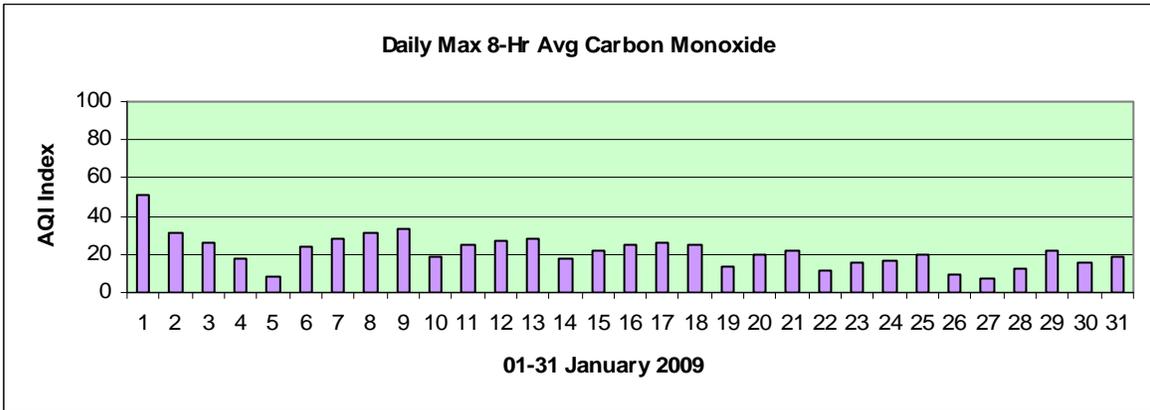
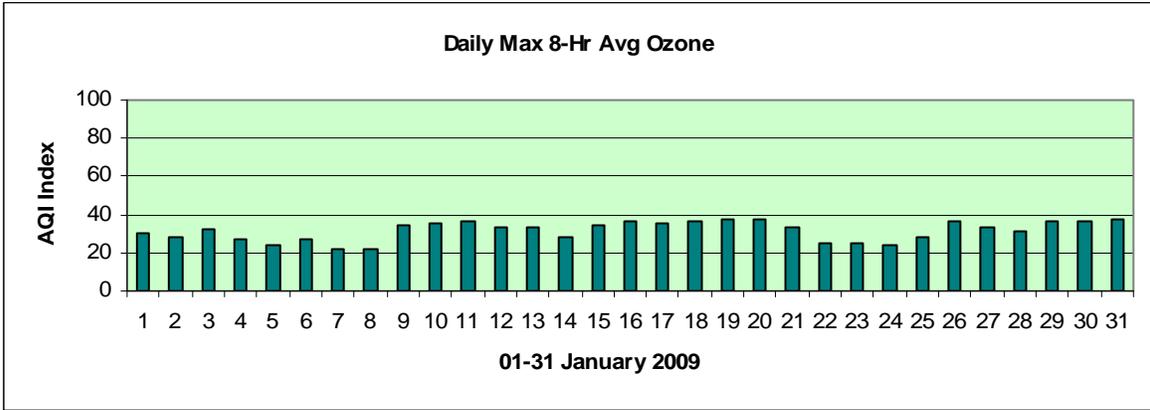
Health Watches issued during JAN 2009-

<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
3	01/01	167	PM-2.5	West Phoenix
	01/02	90	PM-2.5	West Phoenix
	01/08	72	PM-2.5	West Phoenix

High Pollution Advisories issued during JAN 2009-

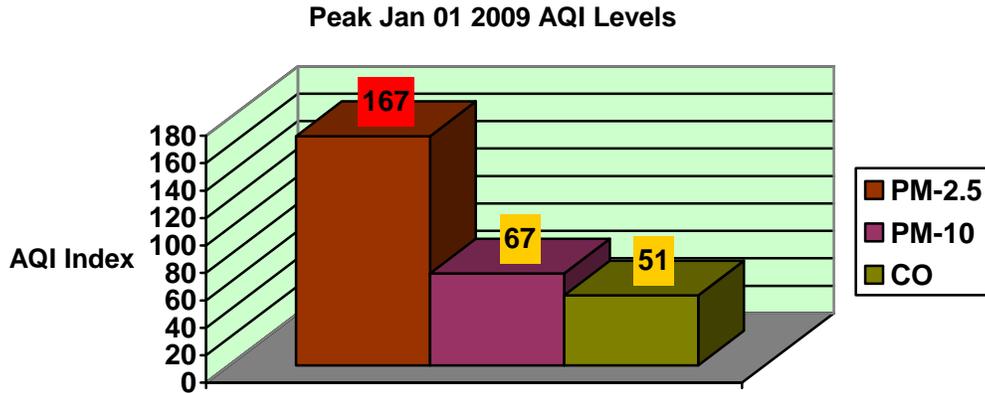
<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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<u>Concentration Recap:</u>	Days in the Good category:	10
	Days in the Moderate category:	20
	Days in the Unhealthy for Sensitive Groups category:	0
	Days in the Unhealthy category:	<u>1</u>
	Total Forecast Days:	31

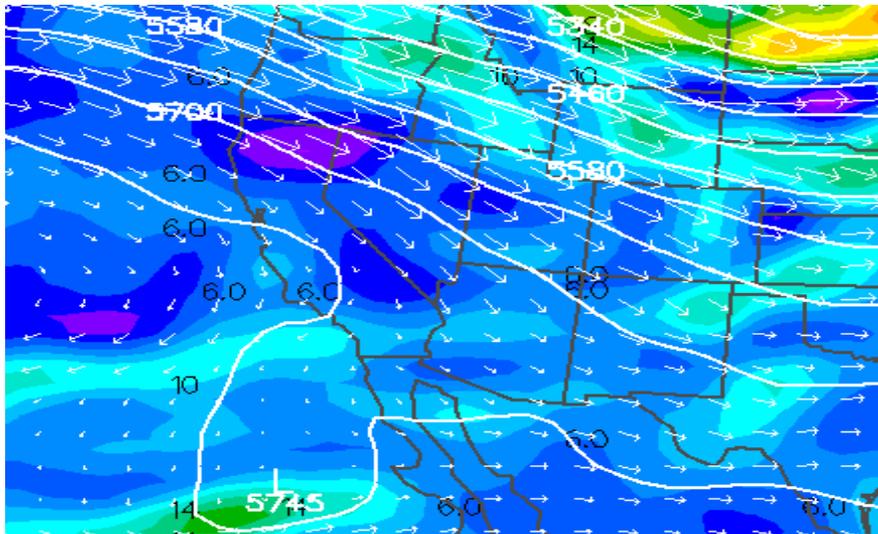


Narrative:

From a local air pollution point of view, the big event in the Phoenix metro area during January 2009 was the fireplace smoke-induced fine particle (PM-2.5) exceedance event on New Year's Day. As was discussed in the December 2008 version of this report, recreational wood-burning has become problematic in the Valley during the winter holiday period. In this case, the highest Air Quality Index (AQI) values of the entire month for three air pollutants – coarse particles (PM-10), fine particles (PM-2.5), and carbon monoxide (CO) – all occurred on the 1st (see chart below):



The synoptic weather situation on January 1 definitely contributed to the accumulation of particle pollution that day. As can be seen from the 500mb chart below it featured a broad and flat ridge aloft; in addition, there was relatively warm air aloft (13 deg C at the 5K' level).



To make matters worse, boundary layer conditions were exceedingly stagnant. Overnight clear skies and light winds helped with the formation of a 7-8 deg C surface-based radiation inversion that extended all the way to 2600'. The mixing depth was only 1900'; however, so the inversion persisted throughout the day; dispersion was very poor. As can be seen from the local VISNET images below, the impacts on visibility were stunning and long-lived:

Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index

Current Index 29

[Details](#)

EXCELLENT

GOOD

FAIR

POOR

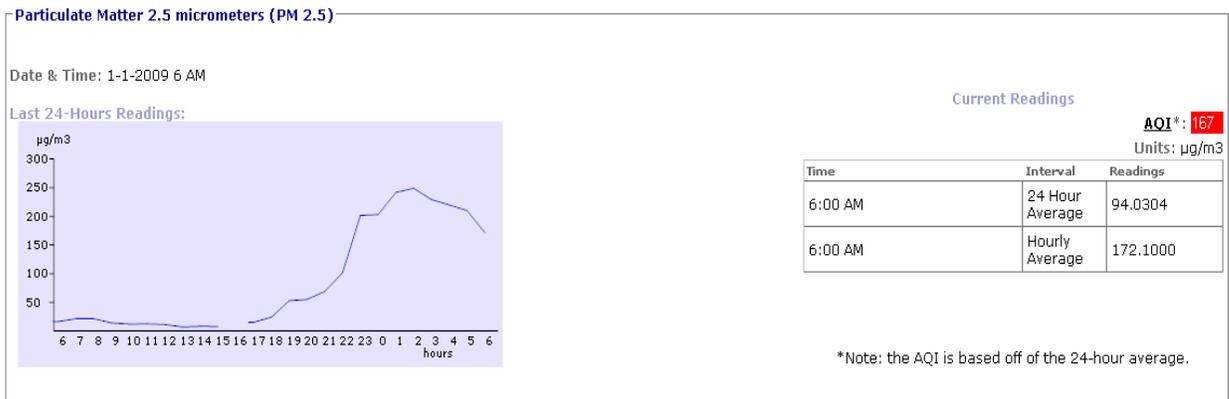
VERY POOR



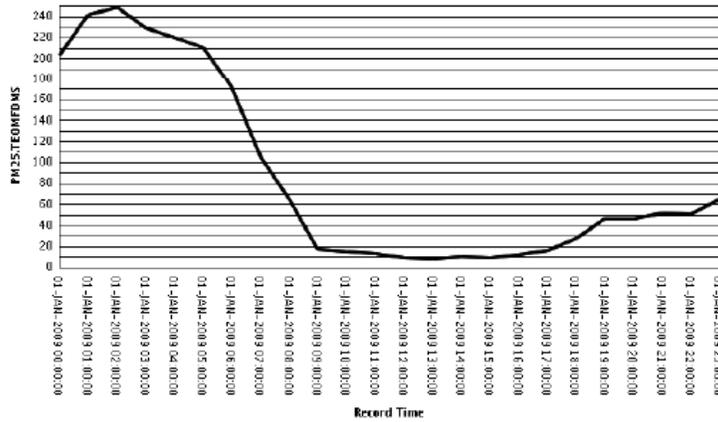
01/01/2009 10:15 AM



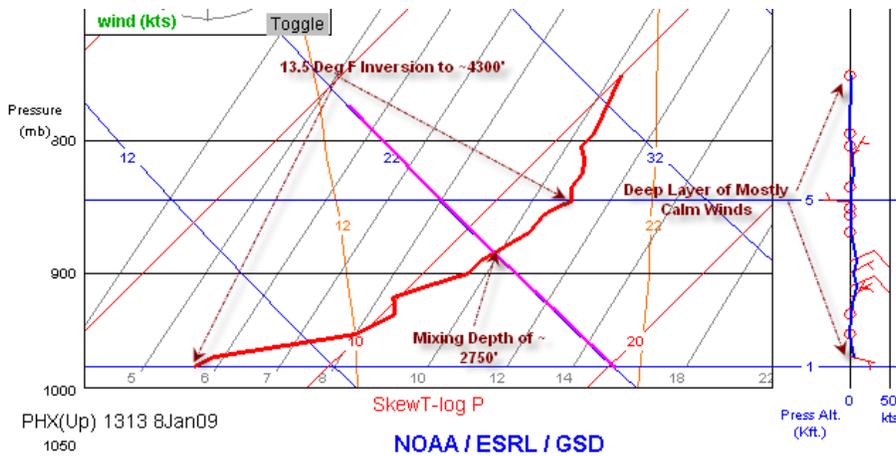
Preliminary data indicated that four local monitoring sites recorded unhealthy levels of PM-2.5 on this date. Highest hourly concentrations ranged from 249.1ug/m³ at West Phoenix to 132.9ug/m³ at Phoenix Supersite. All of these readings occurred between 2:00 and 6:00 a.m. on the 1st. The following pair of PM-2.5 time-series graphs for the West Phoenix site reveals how the exceedance there evolved:



Name: WEST PHOENIX



The first day of January was by no means the only stagnant episode of the month. Two other days – the 8th and the 12th – also stood out. On the 8th data from a local ACARS sounding – a portion of which is shown below – indicated that the best mixing depth was only 2500' but that a 7-8 deg C surface-based radiation inversion extended all the way to 4300'; needless to say, the ventilation index was in the poor category that day. Even though highest PM-2.5 levels were only in the mid-moderate range of the AQI, the pollution was visually quite alarming.



Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index

Current Index 28

[Details](#)

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

The boundary layer temperature profile was even more astounding on the 12th. During the morning a 16 degree F inversion was present that reached to “only” 1800’ but, as shown on the ACARS sounding curve and table illustrations below, 12 of those 16 degrees were within the lowest 500’ of the atmosphere; an average increase in temperature of 1deg F per 42 feet. Local VISNET photography was able to capture a rare image of a dense particle pollution layer over downtown Phoenix looking to the northeast with Camelback Mountain in the background. –Reith

